UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,490	06/25/2007	Chiara Tonelli	2503-1227	8529

466 7590 12/30/2008

YOUNG & THOMPSON
209 Madison Street
Suite 500
ALEXANDRIA, VA 22314

EXAMINER
WORLEY, CATHY KINGDON

ART UNIT	PAPER NUMBER
1638	

MAIL DATE	DELIVERY MODE
12/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/590,490	TONELLI ET AL.	
	Examiner	Art Unit	
	CATHY K. WORLEY	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-32* is/are pending in the application.

4a) Of the above claim(s) *19-21,26-28,30 and 31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15,22-25,29 and 32* is/are rejected.

7)☒ Claim(s) *16-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed Oct. 14, 2008, has been entered.

2. Claims 1-14 have been cancelled.

Claim 32 has been newly added and is drawn to the elected invention.

Rejoinder

3. After further consideration, claims 17 and 18 are rejoined; therefore the restriction between the inventions of Groups I, II, and III that was set forth in the restriction requirement mailed on Jan. 31, 2008, is withdrawn.

4. Claims 15-32 are pending. Claims 19-21, 26-28, 30, and 31 are withdrawn. Claims 15-18, 22-25, 29, and 32 are examined in the present office action.

5. The text of those sections of Title 35, U.S. Code not included in this office action can be found in a prior office action.

Objections and Rejections that are Withdrawn

6. The objections to the specification for the description of Figure 1, the use of trademarks, and the abstract are withdrawn in light of the Applicant's amendments to the specification and abstract.

7. The objection to claims 15 and 16 is withdrawn in light of the Applicant's amendments to the claims.

8. The rejections of claims 15 and 16 under 35 USC 112, second paragraph, are withdrawn in light of the Applicant's amendments to the claims.

9. The rejection of claims 15, 16, 22-25, and 29 under 35 USC 112, first paragraph, for lack of written description is withdrawn in light of the Applicant's amendments to the claims. However, after further consideration a new grounds for rejection has been set forth (see below).

10. The rejection under 35 USC 112, first paragraph, for lack of scope of enablement is withdrawn in light of the Applicant's amendments to the claims.

11. The rejection of claims 15, 16, 22-25, and 29 under 35 U.S.C. 102(b) as being anticipated by Tarcynski et al is withdrawn in light of the Applicant's amendments to the claims.

Specification

12. The amended title of the invention remains objected to because it is not descriptive of the invention. A new title is required that is clearly indicative of the invention to which the claims are directed. The new title should specify an Arabidopsis stomatal-specific promoter or a promoter that is expressed in the stomata. The Applicant did not include "stomatal" or some other indication of the tissue in which the promoter is expressed in the amended title.

Claim Rejections - 35 USC § 112

13. Claims 15, 22-25, 29, and new claim 32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The

portion of the Applicant's arguments in the response filed on Oct. 14, 2008, that are relevant to this new rejection were considered but were not found to be persuasive.

The claims are broadly drawn to a construct comprising a nucleic acid operably linked to SEQ ID NO:1 or a fragment thereof having promoter activity or a promoter having at least 95% identity to SEQ ID NO:1, and to vectors and plants comprising said construct.

The Applicants describe the promoter sequence of SEQ ID NO:1 taken from the Arabidopsis MYB60 gene (see page 5, lines 16-18) which is 1291 bp in length (see sequence listing). The Applicants describe fragments of said promoter as SEQ ID NOs: 2, 3, and 4 (see page 5, lines 18-20), and these fragments are 246 bp, 603 bp, and 999 bp in length, respectively (see sequence listing). They describe constructs comprising the full-length promoter and the fragments of the promoter operably linked to GUS and GFP reporters (see Figure 2). They teach promoter activity for SEQ ID NO:1 and fragments thereof (see pages 10-11).

The Applicants do not describe any fragments of SEQ ID NO:1 other than SEQ ID NOs: 2, 3, and 4 that have promoter activity. The Applicant's do not descibe any nucleic acids with 95% identity to SEQ ID NO:1 that have the same activity as SEQ ID NO:1 as recited in new claim 32.

The essential feature of the fragment is that it has promoter activity (see last line in claim 1). The essential feature of the promoter with 95% identity to SEQ ID NO: 1 is that it has the same activity as SEQ ID NO:1 (see claim 32).

The Federal Circuit has recently clarified the application of the written description requirement to inventions in the field of biotechnology. The court stated that, "A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus." See *University of California v. Eli Lilly and Co.*, 119 F. 3d 1559; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997).

The Applicants fail to describe a representative number of fragments of SEQ ID NO:1 that have promoter activity. Fragments can be as small as dinucleotides, and two base-pair long regions of a nucleic acid that has promoter activity cannot predictably be assumed to also have promoter activity. Deletion analysis of various promoters have shown that even DNA segments from the portion of a promoter region containing sequence elements thought to be most important (*e.g.*, the TATA-box) need to be longer than two basepairs. Maiti et al (1997, Transgen. Res., 6:143-156), in studies on a figwort mosaic virus promoter, found that smallest portion upstream of the transcriptional start site of that would support transcription was 198 basepairs long; segments of 73 and 37 basepairs did not work (Fig. 4). Doelling et al (1995, Plant J. 8:683-692) found that the minimal rRNA promoter of *Arabidopsis thaliana* is at least 33 nucleotides long (Fig. 1). The smallest fragment of SEQ ID NO:1 that was described to have activity by the Applicant was 246 base

pairs long; and this is not sufficient to provide written description support for the large genus of fragments encompassing any fragment with as little as two base-pairs of SEQ ID NO:1; one of skill in the art would not be able to determine which 2-bp fragments comprise promoter activity and which do not.

The Applicants fail to describe a representative number of nucleic acids that have 95% identity to SEQ ID NO:1 and have the same activity as SEQ ID NO:1. Nucleic acids with as little as 95% identity to SEQ ID NO:1 can have as many as 64 substitutions of nucleotides relative to SEQ ID NO:1; therefore this genus encompasses at least 4^{64} molecules. Mutation of promoter sequences also produces unpredictable results. Donald et al (1990, EMBO J. 9:1717-1726) in a mutational analysis of the *Arabidopsis rbcS-1A* promoter found that the effect of a particular mutation was dependent on promoter fragment length (paragraph spanning pg 1723-1724). Prediction of promoter sequences required for tissue-specific expression or hormone-responsive expression, such as the promoter of instant SEQ ID NO:1, is also unpredictable. Identification of the functional parts of promoters is unpredictable. Chen et al (2000, Sex. Plant Reprod. 13:85-94) teach that two promoters with similar expression patterns have major differences in the expression elements required for expression in various flower parts (pg 92, right column, last two paragraphs). The region of a given promoter that has a specific activity cannot be predicted and involves the complex interaction of different subdomains (Benfey et al, 1990, Science 250:959-966, see Abstract, Fig. 3-5). Even a very small region

may be critical for activity, and the criticality of a particular region must be determined empirically (Kim et al, 1994, Plant Mol. Biol. 24:105-117, Tables 1-4, Abstract, Fig. 1-2).

The Applicants only describe the promoter of SEQ ID NO:1 and fragments thereof. Furthermore, the Applicants fail to describe structural features common to members of the claimed genus of variants. Hence, Applicants fail to meet either prong of the two-prong test set forth by *Eli Lilly*. Furthermore, given the lack of description of the necessary elements essential for promoter activity, it remains unclear what features identify variants capable of such activity. Since the genus of variants has not been described by specific structural features, the specification fails to provide an adequate written description to support the breadth of the claims.

Nucleic acids have 95% identity to SEQ ID NO:1 can have as many as 64 substitutions of nucleotides relative to SEQ ID NO:1; and fragments of SEQ ID NO:1 can be as small as dinucleotides. Therefore these recitations encompass a very large genus of molecules, many of which would not have promoter activity and would certainly not have the same promoter activity as SEQ ID NO:1, and most of which were not in the possession of the Applicant at the time of filing. The Applicants have only reduced to practice constructs utilizing the promoter of SEQ ID NO:1 and 3 fragments thereof, all of which have at least 246 contiguous nucleotides of SEQ ID NO:1. Accordingly, the specification fails to provide an

adequate written description to support the genus of variants of SEQ ID NO:1 that have promoter activity as set forth in the claims. (See Written Description guidelines published in the Federal Register/Vol. 66, No. 4/Friday, January 5, 2001/Notices: p. 1099-1111).

The Applicant argues that the specification teaches the fragments comprising SEQ ID NOs: 2, 3, and 4; and discloses that the promoter can have at least 95% identity to SEQ ID NO:1 and retain activity, and the Applicant believes that this disclosure is a sufficient description of a representative number of species of the claimed invention (see page 16 of the response). This is not persuasive, however, because the fragments of SEQ ID NO:2, 3, and 4 each have at least 246 contiguous nucleotides of SEQ ID NO:1, and none of the claims are limited to nucleic acids having at least 246 contiguous nucleotides of SEQ ID NO:1. The current genus of molecules being claimed encompasses fragments as small as dinucleotides, and encompasses nucleic acids with as many as 64 mis-matches that can be anywhere inside the molecule, and therefore have as few as 20 contiguous nucleotides at any given portion of the nucleic acid. This genus is quite large, and the disclosure of three relatively large fragments is not sufficient to support this large genus of molecules.

The Applicant argues that 95% identity scope is currently sanctioned by the USPTO per the current Written Description guidelines (see last paragraph on page 17 of the response). This is not persuasive, however, because the written

description guidelines clearly state that each case must be evaluated on a case-by-case basis to determine the fact pattern and compare the evidence against the scope of the claims. The instant promoter is a tissue-specific and ABA-regulated promoter, and this indicates that the promoter has multiple regulatory mechanisms involved in its regulation. The instant specification provides evidence that three fragments, each of which have at least 246 contiguous base pairs of the full-length promoter, are able to initiate transcription and therefore have promoter activity. The instant specification does not provide any examples of nucleic acids with internal substitutions, deletions, or insertions, relative to SEQ ID NO:1. The instant specification does not describe any fragments smaller than 246 base pairs that retain promoter activity. This fact pattern does not support the broad genus of promoters encompassed by the current claims.

Allowable Subject Matter

14. Claims 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Due to the new grounds of rejection, this action is a second non-final rejection.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CATHY K. WORLEY whose telephone number is (571)272-8784. The examiner is on a variable schedule but can normally be reached on M-F 10:00 - 4:00, with additional variable hours before 10:00 and after 4:00 with additional variable hours before 10:00 and after 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg, can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Cathy K. Worley/
Patent Examiner, Art Unit 1638